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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/752,384	01/05/2004	Frank David McSherry	224684	6813

41505 7590 10/03/2007

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EXAMINER	
PHAM, KHANH B	
ART UNIT	**PAPER NUMBER**
2166	

MAIL DATE	DELIVERY MODE
10/03/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/752,384	MCSHERRY, FRANK DAVID	
	Examiner	Art Unit	
	Khanh B. Pham	2166	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 22, 2007 has been entered. Claims 4, 6, 13 have been amended. Claims 1-19 are pending in this Application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 4, 13-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Kamvar et al. (US 2005/0033742 A1), hereinafter "**Kamvar**".

Claim 1.

Kamvar discloses:

A system for searching web pages comprising:

a database for storing connectivity information about the web pages [link database, Para [0004], [0007], [0020] and Figs. 1-4; and

a page-grading engine associated with an approximation matrix Q', where Q' approximates an ideal matrix Q with respect to the connectivity information (ranks are good approximation to the actual ranks; page ranks are calculated using N x N link matrix) [matrix, Para [0005], [0007], [0008];

wherein the page-grading engine receives as input a personalization description v describing a set of preferences among the web pages, and grades search results with respect to Q' and v (customized (or personalized) link matrix B') [ranking (page grading), Para 0025-0027].

Claim 4.

Kamvar discloses:

A method of grading objects from an interconnected collection of weighted objects, the weights of the objects described by a description v, and the interconnection of the objects described by a description P, the method comprising [Fig 6 Para 20];

applying a grading function Q' to the description v for the objects to determine a set of grades for the objects (determination of ranks (grading function)) [Para 0018, 0021]; and

assigning at least one object the corresponding determined grade for that object [node ranking, Para 0018];

wherein the grading function Q' approximates an ideal grading function Q, where applying ideal grading function Q to the description v produces ideal grades with respect to description P for every object in the interconnected collection of weighted objects (customized (or personalized) link matrix B') [ranking (page grading), Para 0026-0027].

Claim 13.

Kamvar discloses:

A system for grading objects from an interconnected collection of weighted objects comprising:

a description v of the weights of the objects [personalization weights v, See Kamvar Para 0026];

a description P of the interconnection of the objects (links between elements) [link matrix (interconnection), See Kamvar Para 0026]; and

an object-grading engine for approximating an ideal grading function Q with an approximate function Q', where applying ideal grading function Q to the description v produces ideal grades with respect to description P for every object in the

interconnected collection of weighted objects, and for assigning at least one object the grade produced for that object by an application of Q' to v (customized (or personalized) link matrix B') [ranking (page grading), Para 0026-0027].

Claim 14.

Kamvar discloses the elements of claim 13 as above and furthermore it discloses a search engine in connection with the object-grading engine, wherein the object grading engine grades objects passed from the search engine (rank (grade),search results) [Kamvar Para 0031].

Claim 15.

Kamvar discloses the elements of claim 13 as above and furthermore it discloses wherein the objects are web pages [Kamvar Para 0007].

Claim 16.

Kamvar discloses:

A computer-readable medium including computer-executable instructions facilitating the grading of web pages, the web pages interconnected corresponding to a matrix P, computer-executable instructions executing the steps of [Para 0026-0027]:

computing a representation of an approximation, matrix Q' to an ideal matrix Q

(customized (or personalized) link matrix B' from Matrix B) [ranking (page grading), Para [0026]-[0027]; and

applying Q' to a personalization vector v to obtain grades of the web pages (customized (or personalized) link matrix B' from Matrix B; personalization weights v) [ranking (page grading), Para 0026-0027].

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamvar as applied to claims above, and in view of Achlioptas ("Fast Computation of Low Rank Approximations", hereinafter "Achioptas".

Claim 5.

Kamvar discloses the elements of claim 4 as above but does not explicitly indicate "low-rank optimal approximation" [see Achlioptas section 1.1 and 3].

It would have been obvious to one of ordinary skill in the art to have combined the cited references because "low-rank optimal approximation" as disclosed by Achlioptas would have enabled Kamvar to capture the degree of freedom of its entries

thus retaining only the most pertinent characteristics of the data [See Achlioptas section 1.1].

6. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamvar and Achlioptas as applied to claims above, and further in view of Page (US 6,285,999), hereinafter "Page".

Claim 6.

The combination of Kamvar and Achlioptas discloses the elements of claim 5 as above but does not explicitly indicate the element of claim 6. Page discloses the claimed element wherein entry P[i,j] in matrix P represents the probability of reaching one object i from another object j in one step of a random walk among the weighted objects [random jump, probability, See Page Col 5 lines 25-30, Col 6 lines 15-20, 40-43 and Fig 2-3].

It would have obvious to one of ordinary skill in the art to have combined the cited reference because probability of reaching one object from another object in one step of a random walk (random walk) would have enabled Kamvar to limit the extent to which a document's rank can be inherited by children documents.

Furthermore it helps to model the typical jumping of users to a different place in the web after following a few links [Page Col 6 lines 50-60].

Claim 7.

The combination of Kamvar, Achlioptas and Page discloses the elements of claim 6 as above and furthermore Page discloses wherein at each step of the random

walk there is a fixed probability c that the walk will reset, and that the random walk then continues from object a with probability v[a] [random jump, probability, See Page Col 5 lines 25-30, Col 6 lines 15-20, 40-43 Fig 2-3].

Claim 8.

The combination of Kamvar, Achlioptas and Page discloses the elements of claim 7 as above and furthermore Page discloses wherein the ideal grade of an object b is the probability of arriving at object b at a step of the random walk [random jump, probability, See Page Col 5 lines 25-30, Col 6 lines 15-20, 40-43 Fig 2-3].

Claim 9.

The combination of Kamvar, Achlioptas and Page discloses the elements of claim 5 as above and furthermore Page discloses wherein the objects are web pages [Web, See Page Col 6 lines 50-60].

7. **Claims 1-19** are rejected under 35 U.S.C. 102(a) as being anticipated by Haveliwala et al. ("An Analytical Comparison of Approaches to Personalizing PageRank"), hereinafter **Haveliwala**.

As per claim1. Haveliwala teaches a system for searching web pages comprising:

- "a database for storing connectivity information about the web pages" at page 1;

(Haveliwala teaches PageRank database comprises directed Web graph G which stores connectivity information about web pages"

- "and a page-grading engine associated with an approximation matrix Q', where Q' approximates an ideal matrix Q with respect to the connectivity information" at page 1, 1st and 2nd paragraph;

(Haveliwala teaches the "PageRank" for ranking web pages, associated with "low-rank approximations of matrix Q, denoted as Q)

- "wherein the page-grading engine receives as input a personalization description v describing a set of preferences among the web pages, and grades search results with respect to Q' and v" at page 2.

(Haveliwala teaches the personalization vector v which causes bias to prefer certain kinds of pages for use with the matrix Q to create personalizing PageRank vector that allows for personalization on arbitrary sets of pages)

As per claim 2, Haveliwala teaches the system of claim 1 wherein "approximation matrix Q' is a rank-k matrix whose representation comprises a singular value decomposition comprising matrices V.sub.k, S and U.sub.k.sup.T for a parameter k" at page 3.

As per claim 3, Haveliwala teaches the system of claim 2, "wherein v is a vector and Q' times v is an optimal approximation to Q times v over all rank-k matrices" at pages 2-3.

As per claim 4, Haveliwala teaches a method of grading objects from an interconnected collection of weighted objects, the weights of the objects described by a description v, and the interconnection of the objects described by a description P, the method comprising: applying a grading function Q' to the description v for the objects to determine a set of grades for the objects; and assigning at least one object the corresponding determined grade for that object; wherein the grading function Q' approximates an ideal grading function Q, where applying ideal grading function Q to the description v produces ideal grades with respect to description P for every object in the interconnected collection of weighted objects, rendering an indication of at leastone graded object" at pages 1-3.

As per claim 5, Haveliwala teaches the method of claim 4 "wherein P, Q, and Q' are matrices, v is a vector, and the approximation is a low-rank optimal approximation" at pages 2-3.

As per claim 6, Haveliwala teaches the method of claim 5 wherein "entry P[i,j] in matrix P represents the probability of reaching one object i from another object j in one step of a random walk among the weighted objects" at page 1.

As per claim 7, Haveliwala teaches the method of claim 6 wherein "at each step of the random walk there is a fixed probability c that the walk will reset, and that the random walk then continues from object a with probability v[a]" at pages 1-2.

As per claim 8, Haveliwala teaches the method of claim 7 wherein "the ideal grade of an object b is the probability of arriving at object b at a step of the random walk" at pages 1-2.

As per claim 9, Haveliwala teaches the method of claim 5 wherein "the objects are web pages" at page 1.

As per claim 10, Haveliwala teaches amethod of grading objects from an interconnected collection of weighted objects by approximating a matrix Q with respect to a parameter k, comprising: "computing a matrix U.sub.k; computing a matrix V.sub.k; computing a diagonal matrix S; defining the approximation to Q as the matrix product V.sub.k S U.sub.k.sup.T; and determining a grade for at least one of the objects using the approximation to Q; wherein the weights of the objects are described by a vector v, the interconnection of the objects is described by a matrix P, and the ideal grade of object i with respect to matrix P equals Q[i] times v where Q[i] is the ith row of an ideal matrix Q" at pages 1-3.

As per claim 11, Haveliwala teaches the method of claim 10 further comprising: "choosing a sufficiently large parameter d; and computing an intermediate matrix M with respect to P; wherein matrix U.sub.k, comprises the k principal eigenvectors of dI-MM.sup.T and matrix V.sub.k comprises the k principal eigenvectors of dI-M.sup.TM,

and wherein matrix S=(dI-D).sup.-1/2, where D is the diagonal matrix comprising the k eigenvalues corresponding to the k principal eigenvectors of dI-MM.sup.T" at pages 2-3.

As per claim 12, Haveliwala teaches the method of claim 11 wherein "computing an intermediate matrix M with respect to P is further with respect to a constant c" at page 2.

As per claim 13, Haveliwala teaches a system for grading objects from an interconnected collection of weighted objects comprising: "a description v of the weights of the objects; a description P of the interconnection of the objects; and a processor comprising an object-grading engine for approximating an ideal grading function Q with an approximate function Q', where applying ideal grading function Q to the description v produces ideal grades with respect to description P for every object in the interconnected collection of weighted objects, and for assigning at least one object the grade produced for that object by an application of Q' to v" at pages 1-3.

As per claim 14, Haveliwala teaches the system of claim 13 "further comprising a search engine in connection with the object-grading engine, wherein the object-grading engine grades objects passed from the search engine" at page 1.

As per claim 15, Haveliwala teaches the system of claim 13 wherein "the objects are web pages" at page 1.

As per claim 16, Haveliwala teaches "a computer-readable storage medium including computer-executable instructions facilitating the grading of web pages, the web pages interconnected corresponding to a matrix P, computer-executable

instructions executing the steps of: computing a representation of an approximation matrix Q' to an ideal matrix Q; and applying Q' to a personalization vector v to obtain grades of the web pages" at pages 1-3.

As per claim 17, Haveliwala teaches the computer-readable medium of claim 16 "wherein Q' is a rank-k matrix whose representation comprises a singular value decomposition comprising matrices V.sub.k, S and U.sub.k.sup.T for a parameter k" at pages 2-3.

As per claim 18, Haveliwala teaches the computer-readable medium of claim 17 "wherein Q' times v is an optimal approximation to Q times v over all rank-k matrices" at pages 1-3.

As per claim 19, Haveliwala teaches the computer-readable medium of claim 17, "the computer-executable instructions further executing the steps of: applying the grading of web pages produced by Q' to the results of a search query; and outputting the results of the search query sorted according the grading" at page 1.

Response to Arguments

8. Applicant's arguments filed March 22, 2007 have been fully considered but they are not persuasive. The examiner respectfully traverses applicant's arguments.

Regarding claims 1, 4, and 13-16, applicant argued that Kamvar does not teach "a database storing connectivity information about the web pages". On the contrary, Kamvar teaches at [0004] a linked database which can be represented as a directed graph of N nodes, where each nodes corresponds to a web page and where the directed connections between nodes correspond to directed links from one web page to another. Kamvar's Figs. 1-2 also shown the structure of the database comprises connectivity information about web pages".

Applicants further argued that Kamvar does not disclosed or suggest "a personalization description v describing a set of preferences among the web pages". On the contrary, Kamvar teaches at [0026] that "The link matrix weighs may also depend on **personalization weights**, resulting in block ranks that are customized to an individual. For example, **K personalization weights v_1, ... v_k** may be used to derive a customized link matrix B' from the generic **link matrix B**..." and "by selecting the K weights to reflect levels of **personal interest** in subject associated with the **K blocks**, the resulting block **link matrix** will be altered so that the transition more accurately reflect **personal preferences**".

Applicant also argued that "Kamvar's personalization weights are merely an individual's choice of weight used to calculate the B matrix", this is incorrect. As seen in paragraph [0026] discussed above. Kamvar does not use personalization weights v1,.. vk to calculate the B matrix, but instead applies the personalization weights to the B matrix to derive a customized link matrix B' from the generic link matrix B.

Conclusion

Examiner's Note: Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

In the case of amending the Claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

The prior art made of record, listed on form PTO-892, and not relied upon, if any, is considered pertinent to applicant's disclosure.

If a reference indicated as being mailed on PTO-FORM 892 has not been enclosed in this action, please contact Lisa Craney whose telephone number is **(571) 272-3574** for faster service.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh B. Pham whose telephone number is (571) 272-

4116. The examiner can normally be reached on Monday through Friday 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain Alam can be reached on (571) 272-3978. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Khanh B. Pham
Primary Examiner
Art Unit 2166

September 24, 2007